

LOS ALAMOS NATIONAL LABORATORY



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# *the Atom*

December 1979





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**ON THE COVER:**

*Diani Shurr, a blind jazz singer from Tucson, displayed her feelings upon finishing the national anthem to kick off the Special Olympics in Albuquerque this autumn. A softball game at the sports stadium involved media personalities and raised \$27,000. Story, more photos, page 4.*

# Preview:

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2

*Heat search  
in New York*



Three areas in New York state have better-than-average chances of producing energy from deep hot rock, according to scientists. Detailed surveys, under a contract with the Los Alamos Scientific Laboratory, are being conducted by researchers from the State University of New York at Buffalo and the New Mexico State University. Whether power can be developed to turn a turbine hasn't been determined yet...

4

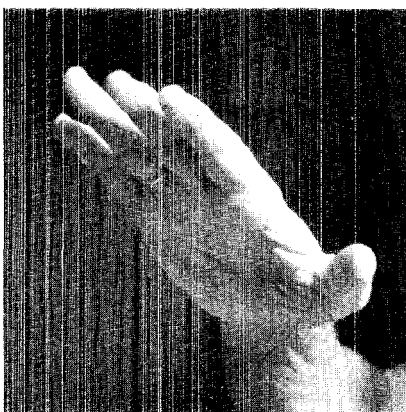
*Learning  
through  
experience*



The philosophy toward mentally handicapped persons has changed in recent decades. Efforts now are aimed at vocational and social training, so that these people can work toward rewarding employment through programs in Los Alamos and Espanola. We thought you'd like to know about some of the many deserving persons that LASL employs; the Laboratory, in fact, has been termed a model in this area...

12

*Edward  
Teller*



Edward Teller is known for speaking out. When a LASL film crew visited him at his home in Stanford, California, he lived up to his reputation. The crew is making a series of films on outstanding science personalities from the 1943-45 Project Y days, and Teller spoke of his initial love for science, his emigration to America, his work on the first fission bomb, his thoughts on energy today...

18

*No to  
SALT II*

20

*Years  
ago*

25

*Among our  
visitors*



*Photo by Johnnie Martinez*

*In 1977, LASL proved that water could be circulated through deep, hot dry rock; and would arrive at the surface warm enough to flash to steam. Now, as the search for promising areas other than the Jemez Mountains continues, researchers have said that 3 regions in New York state may have geothermal potential.*

## *Geothermal surveys under way in New York State*

Three areas in New York state possess an above-average potential for hot dry rock development, according to scientists. Whether these regions will ultimately help turn a power turbine is yet to be determined.

Detailed geophysical surveys are now being conducted by researchers from the State University of New York (SUNY) at Buffalo and the New Mexico State University (NMSU).





Working under a contract with the Los Alamos Scientific Laboratory, they hope to locate areas with high amounts of heat locked into deep impermeable rock.

Though the studies have not been detailed statewide, researchers see promise in the East Aurora area, near Buffalo; the Cayuga area, near Rochester; and the Elmira area, west of Binghamton.

Team members are quick to point out that although their studies "have confirmed the existence of significant

geothermal anomalies in central and western New York state, further studies are required to define the magnitude and extent" of them.

Geochemical analyses of the areas indicated that all 3 anomalies are enriched in silica concentrations, relative to the surrounding areas. This indicates abnormally high temperatures below the surface, according to Dennis S. Hodge of SUNY, who is the principal investigator on the prospecting team. He is aided by Kenneth Hilfiker and Robert DeRito, both from SUNY, and by Paul Morgan and Chandler Swanburg, both from NMSU.

Hodge said the initial study had a 3-fold interest: preliminary geochemical sampling of the area; analysis of gravity data to determine the mass distribution below the surface; and acquiring a complete data set of bottom hole temperatures in New York. The latter temperatures, he explained, were obtained from some 850 existing wells that were previously drilled for a variety of reasons.

Analyzing these temperatures established heat gradients for different areas in New York state. The gradients tell scientists how hot they can expect rock to be at a given depth. Gradients, usually expressed in degrees Celsius per kilometer of depth, are useful for extrapolating temperatures below the bottoms of the tested holes.

Because of the many unknowns and variables, there are no sure indicators — short of drilling — said Hodge.

The team has also studied existing gravity data. The subsurface makeup is reflected by the intensity of the gravity in specific areas. Knowing what type of rocks can be found, researchers can more readily pinpoint their origins, and add to the knowledge of geothermal activity nearby.

Taken separately, none of the geologic parameters conclusively prove the geothermal potential of an area. They must be considered with an array of other

information, said Hodge. The team expects to publish further findings which could shed additional light on the question of hot dry rock areas in New York state.

LASL will remain involved in the project. Staff researchers were in Albany November 16-18 in conjunction with Energy Expo '79, coordinated through the New York State Energy Office. They were on hand at the Rockefeller Plaza event to explain that hot dry rock, in keeping with the Department of Energy's policy of transferring new technology to the public's use.

The 3 New York areas have been shown to contain developable levels of hydrothermal energy, such as hot water or steam, but they do have relatively high amounts of heat locked in impermeable rock. It is this type of dry heat that promises to provide an additional future source of electricity, space heat, or industrial heat for energy-hungry America.

"This type of system has at least 2 advantages," said Gregory Nunz, who from LASL manages the national Hot Dry Rock Geothermal Energy Development Program. "It is environmentally clean, and depending on economics, can technically be employed almost anywhere."

The concept, as demonstrated near Los Alamos, involves drilling a hole into the earth's crust, to perhaps 13,000 feet. A fractured reservoir is formed hydraulically at the bottom, and a second hole is drilled to intersect it. Cold water is pumped down the deeper of the 2 holes and is heated by the rock, then is brought back under pressure. On the surface, it can be used to turn a turbine or for space heating, then is recycled downward again.

The hot dry rock program includes exploratory efforts nationwide. Commercial planning is underway, with the goal of building an electrical generating plant at the Laboratory's research site, Fenton Hill, near Los Alamos.

— Vic Hogsett

# **“A learning experience for both sides.”**

*Photos by LeRoy N. Sanchez*

*Silvia Ortega mastered the mechanical hand in the Bradbury Science Hall during a recent field trip from the Espanola Adult Education Center.*





Doctors did not expect Richi Barns to live.

For the first 8 weeks of his life, he weathered a severe case of gastroenteritis — an inflammation of the stomach and intestinal tract — but a high fever caused brain damage.

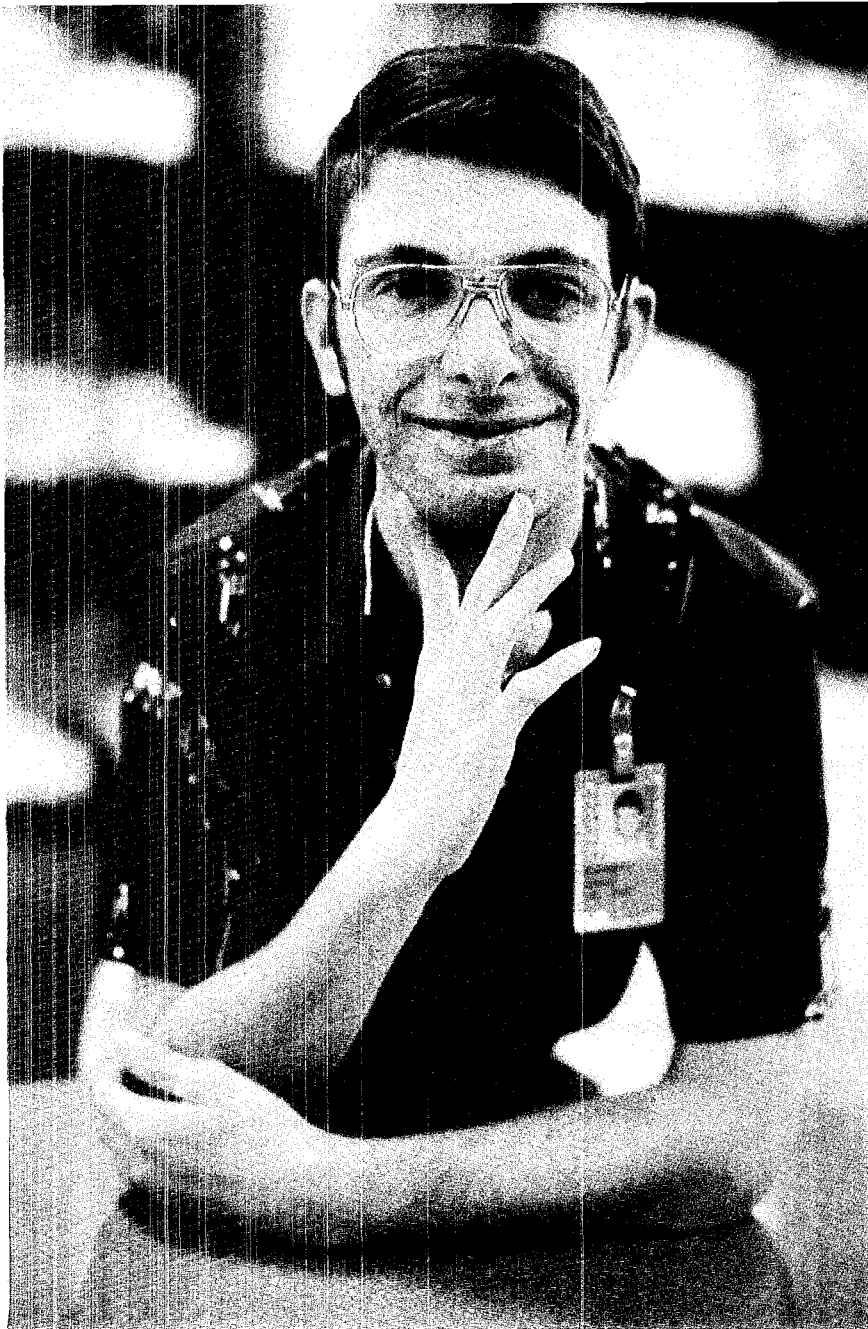
Complications plagued him with physical problems through his teenage years.

With a background of bouts against physical and mental problems, Richi's future seemed uncertain. But now this animated young man enjoys a full life, including a job as a materials handler in the Supply and Property (SP) Department office. The ingredients that helped were love, understanding, and specialized training.

In the past, care and treatment of the retarded was less than vocational. Efforts today are directed toward education in the home, along with improved sheltered workshops, medical treatment, special schooling, and job training. Many retarded persons have proven themselves to be relatively productive and independent, although guidance is required to aid their adjustments into society.

LASL employs a number of mentally handicapped persons. "Matching jobs with talents is of the utmost importance," said Dimas Chavez, head of the Employee Relations Office. Chavez has been involved with the mentally handicapped for 25 years and is the president of the Special Olympics in New Mexico; he is also active in the Joseph P. Kennedy, Jr. Foundation. Through Chavez and other like-minded persons, LASL cooperates with the Los Alamos Sheltered Workshop, the state Department of Vocational Rehabilitation, and a program at the Los Alamos High School.

"LASL has been very receptive to the mentally handicapped



*Richi Barns, SP-DO, enjoys his job as a materials handler here.*

people working at the Laboratory. LASL is becoming a model for other governmental agencies and businesses to follow," said Chet Swanson, who directs the Los Alamos Sheltered Workshop.

The Workshop was created in 1970 by the Association for Retarded Citizens and exemplifies many such structures around the world. A year ago, it began to expand its programs, thanks to sister organizations like the United Way and to community interest. The Workshop aims at vocational training, said assistant

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*"LASL is becoming a model for other governmental agencies and businesses to follow."*



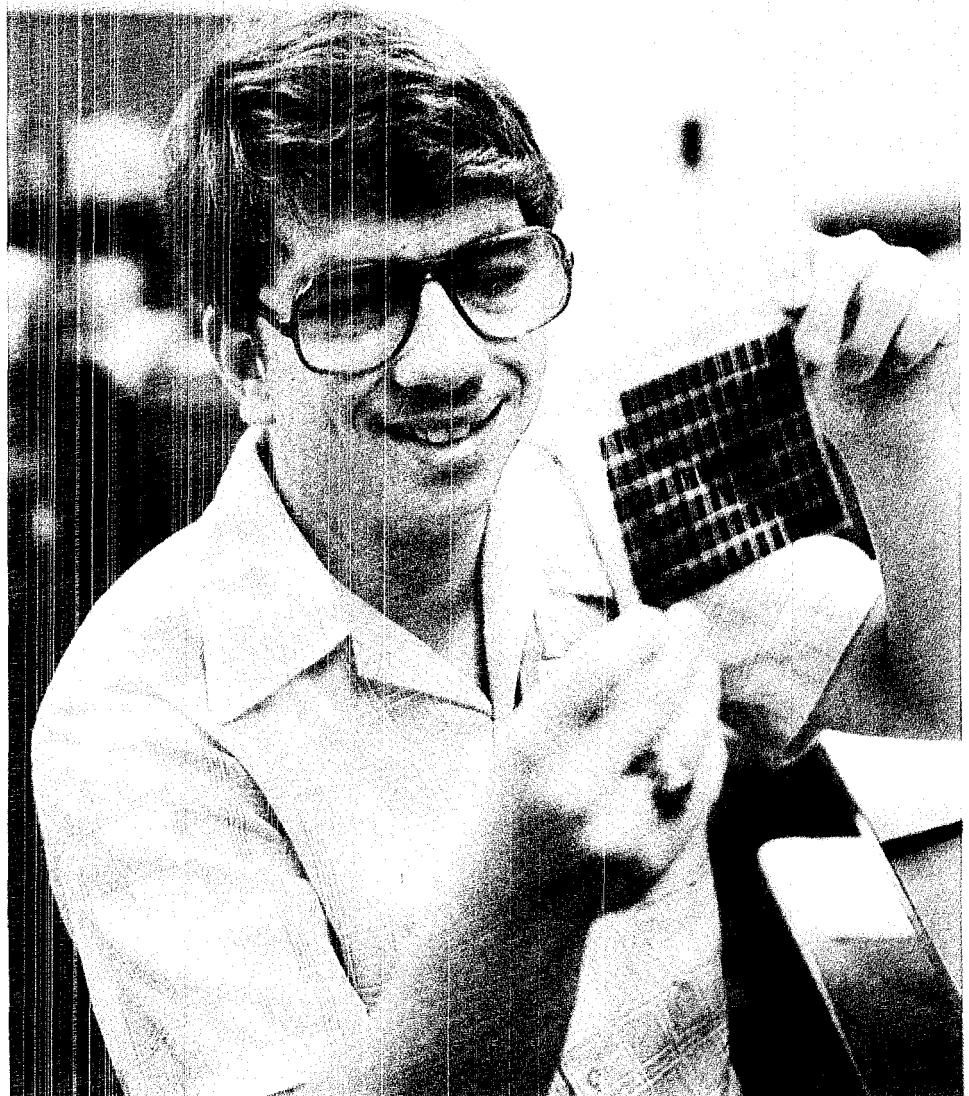
*Bruce Blankenship, a trainee in the Los Alamos Sheltered Workshop, engraves name plates for the Laboratory.*

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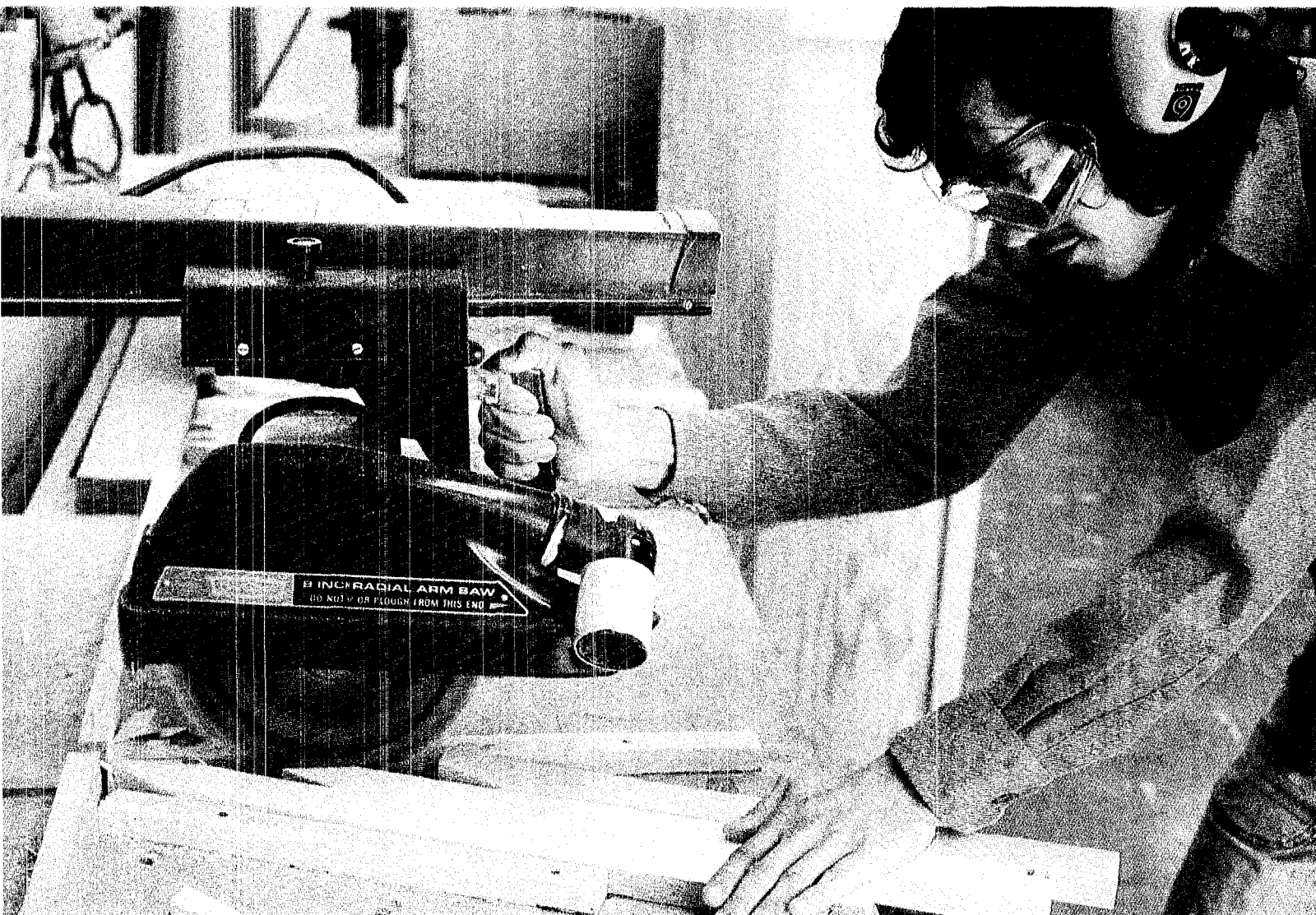
*Jobs include janitorial work, capping bottles, marking property, painting, engraving letters, and graphic arts.*

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*Terry McFadridge examines microfilm as part of his job in ISD-7. A class in graphic arts printing helped him qualify for a Skills Training Employment Program position here.*







*John Martinez prepares stakes used in concrete work. He is a trainee with the Los Alamos Sheltered Workshop.*

director Valerie Van Broklin, who has set up a system that allows 80 per cent work time and 20 per cent for therapy and living skills.

Most trainees' work is away from the Workshop, but under Workshop staff supervision. A large number of contracts are for LASL jobs. These include maintenance and janitorial work for 64 apartments and 5 trailers; cleaning out warehouse bins, capping and boxing empty bottles, and marking laundry and other LASL property. Other tasks include painting bookshelves, installing fire extinguishers, and engraving letters for name plates.

A new pursuit, designed for preschoolers, is conducted at the Espanola Early Learning program. Reaching these people is vital, because children learn easier and faster than adults. Educating the mentally handicapped in the past was not mandatory, and some who are now adults missed out.

"What can be done before the age of 5 is astounding," said the Workshop's Swanson. "Studies show that some handicapped children with early, specialized training increase their IQs by as much as 30 points."

At the Adult Education Center,

also in Espanola, the concentration is on basic living skills.

Handicapped adults learn how to shop for food, prepare meals, manage money, and practice personal hygiene. The fundamentals of looking for a job are also covered.

The Center also teaches academics and athletics in addition to physical and speech therapies. When adults are qualified, contract work is brought in from the outside and is performed for pay. Trainees graduate to the Los Alamos Sheltered Workshop for outside jobs.



*Jerry Tafoya from the Espanola Adult Education Center learns to mark LASL property under the supervision of Charles Weir.*

*In the United States, an estimated 3 per cent of the population is mentally handicapped. In New Mexico alone, 20,000 persons need specialized training.*

Working simultaneously at LASL and with community organizations, Swanson continued, provides a realistic environment to train people for jobs. The attitude toward the handicapped has changed in the last 10 years, he added, allowing the "technology of teaching" to change.

Sheri Spencer, of the Systems and Central Services group (PER-3), has found that hiring and working with a handicapped person is a rewarding experience for both. She has supervised

Sandra Larson, a Los Alamos Special Education graduate, for 8 months. Clerk Sandra now delivers mail and is learning how to file.

"At first, Sandra was apprehensive," said Spencer. "But after a few days, she really opened up and now she's one of the gang. It's been a learning experience for both sides."

Terry McFadridge also came to LASL from the special education program. With a class in graphic arts printing as part of his resume, he qualified for a Skills Training Employment Program position in the Graphic Arts (ISD-7) group.

In the United States, an estimated 3 per cent of the population is mentally handicapped. In New Mexico alone, 20,000 men, women, and children need specialized training. Programs like the Sheltered Workshop and the Adult Education Center are barely touching the surface as they reach those in need.

A program that reaches more than a million people, here and abroad, is the Special Olympics competition. It has become the largest program in the world of sports training and athletics for the metnally handicapped since its founding in 1968 by the Joseph P. Kennedy, Jr. Foundation. Activities cover track and field, swimming and diving, gymnastics, basketball, volleyball, bowling, skiing, and wheelchair events.

Sandra, who won 3 first place medals in state competition, said the Special Olympics give her a chance to "meet people and gain self confidence."

Physical activity can produce better coordination, muscle tone, strength, and stamina. The Special Olympics, with categories based on age and ability, includes all mentally handicapped persons.

*Bob Witmore, right, a Los Alamos special education graduate, works as an animal caretaker in LS-1.*





Rehabilitation programs in every state and in many foreign countries provide sports training and year-around competition.

In New Mexico, volunteer directors oversee Special Olympics programs in each of 7 districts. Local training is continuous; state-sponsored competition is held 4 times a year in different cities. Rotating games encourage public exposure and socialization.

To help raise the thousands of dollars needed for special programs, many celebrities assist the Special Olympics by serving as coaches, fundraisers, or award-givers. The New Mexico Special Olympics this year had help from some of America's TV personalities. Ron Howard, Anson Williams, and Donny Most — commonly known as Richie, Potsie, and Ralph Malph — led the "Happy Days" softball team. Don Perkins, former Dallas Cowboys running back, managed the Albuquerque team that included Dick Knipfling, Mary Lynn Roper, and Jim Boggio, all Albuquerque news persons.

The final score was 25-3 for Happy Days, at the Albuquerque field, and \$27,000 for the New Mexico Special Olympics.

Special Olympics participants become healthier in dimensions other than athletic. With new skills and accomplishments, they feel better about themselves. When their parents, brothers, and sisters see them achieving results, they may move to closer family ties. Because friends and neighbors share in the activities, the community is more prone to accept mentally handicapped persons into society.

This is perhaps the most important of all.

(If you desire more information about these programs, contact Dimas Chavez at LASL, (505) 667-4856 or Micky Henry, state executive director, at the New Mexico Special Olympics, (505) 266-8893).

By Dannie Jones-Harvey



**Above:** Anson Williams, Donny Most, and Ron Howard on their way to play the Albuquerque All Stars in a fundraising game. The Happy Days team won, 25-3. **Right:** Sandra Larson, far right, delivers mail and is learning to file at PER-3. Supervisor Sheri Spencer said the experience has been rewarding for both. **Below:** Cheryl Wise, a floor instructor at the Los Alamos Sheltered Workshop, watches trainee Bob Kemp as he marks laundry at the Laboratory.









*An interview with*

# EDWARD TELLER





Edward Teller was filmed at his Stanford, California, home this summer by a LASL crew. The first in a series of movies dealing with scientific figures and the history of the WW II years took shape.

He was outspoken, engaging, and honest. "There was never any doubt in my mind, as far as I can remember, what I really wanted to do, although I called it by the wrong name. I thought I would like to be a mathematician," said Teller of his youth in Budapest, Hungary.

Teller, as an emigre, came to America and worked in Los Alamos on the Manhattan Project during the war. He later was the director of the Lawrence Livermore Laboratory and was instrumental in developing the hydrogen bomb, which he termed "the super."

Because many of Teller's comments are worth reading, in our view, we are presenting salient passages here, taken from a 12-page transcription of the interview.

Excerpts and still pictures will also be used in the LASL science hall booklet series, and in video tapes to be shown to visitors.

The crew from the Public Affairs Department included Mario Balibrera (PUB-DO) as producer and director; Fred Baker and Larry Gibbons (PUB-4) as cinematographers; Bob Wellnitz (PUB-4) as soundman; and Bill Jack Rodgers (PUB-1) as still photographer. Rodgers took the pictures seen here.

*"But I cheated. After 2 years my father gave up, and he said, now you study what you want."*

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"I was sure, up to the time I met Klug (Leopold Klug was a retired mathematics professor in Budapest)... that all grown-ups were people to be pitied. They had to work; they grew tired; they were bored with what they were doing. I heard both my parents often complain. Klug was the first man whom I met who most obviously enjoyed what he was doing. I had been interested in mathematics; what I learned from Klug is that mathematics is fun...

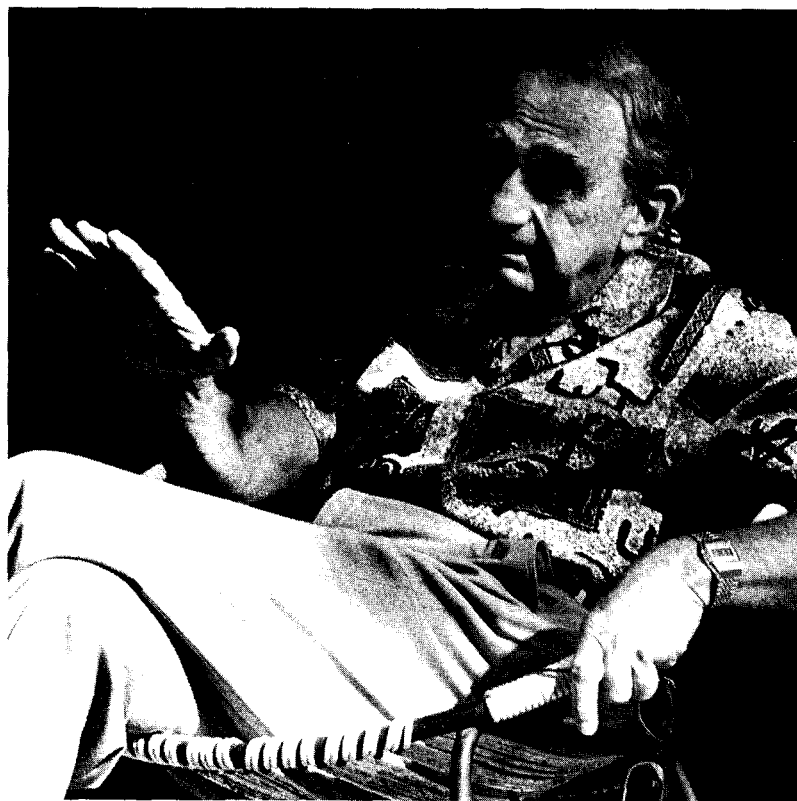
"Then a few years later it came to a real choice. I wanted to study mathematics and my father said you can't make any living by being a mathematician, and then in the end, a little painfully, we compromised on chemistry. But I cheated. I studied chemistry and mathematics, and after 2 years my

father gave up and he said, now you study what you want... by that time, I had heard of the great advances in atomic theory. That was 1928. I was 20 years old and quantum mechanics had been discovered. A whole new world and something entirely unsuspected...

"Preparing to go for a hike on a Sunday (in Munich) I thought I was in a hurry and I jumped off a street car... I fell, my right leg got under the wheels, and my right foot was cut off... so for the next term I went to a new place, Schlesvig. I heard of a man who was barely 6 years older than I am, and was a full professor, Werner Heisenberg. It was at that time that I fell in love with theoretical physics, and I did not intend ever to do anything else, nor would I do anything else today...

"Sooner or later I had to get a job. When I went into exile, it was not Siberia. It was only Gottingen, another famous place, and I continued to do theoretical physics... but at this time, I could not help but begin to become aware of a really terrifying danger that was going to destroy Germany and most of Europe: Hitler. I was quite young during the first world war, but I knew what war is, I knew that very well...

"Being a Jew, it was very clear that I had to leave Germany... I was thoroughly ignorant of politics but it became more and more clear that politics will not stay away from those who are ignorant of it... Anyone who wanted to leave Germany, and who had a good record as a scientist was offered a temporary job in England. I had married a clever woman, who had studied in the United States and absolutely insisted to get back... So we





*"So I started my career in atomic physics as Szilard's chauffeur, driving him out to the end of Long Island."*

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came to the George Washington University, and there a few years later, at the conference which we had organized, a very famous physicist, Neils Bohr, announced the fact of the fission of uranium. That was in January 1939...

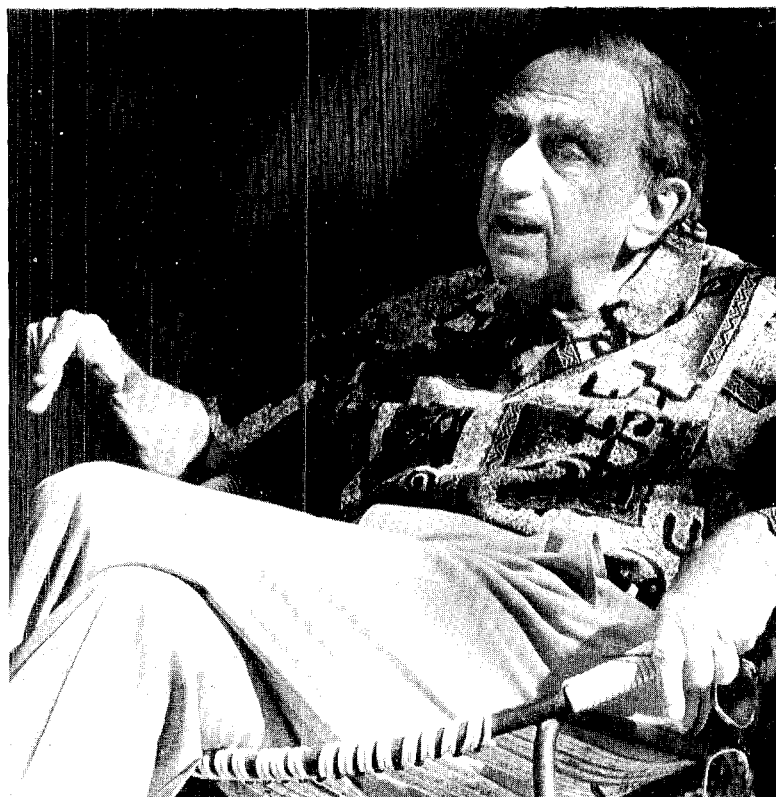
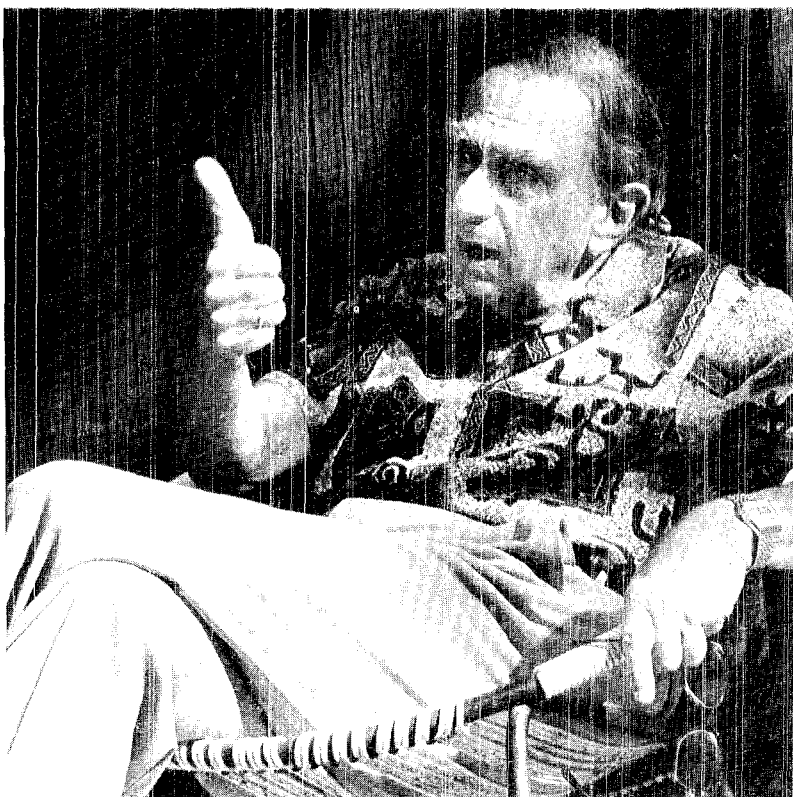
"When everybody had left and we were completely tired out, the phone rang, my good old friend from Hungary. (Leo) Szilard, as soon as he could, said to me, in fact already in the car, do you know what this idea, and this fact of uranium fission means? This means an atomic explosion, and he explained it to me... I will only say that he had started to prepare me for a difficult career, because by now I not only knew that politics will not leave scientists alone, I also found out that scientists won't leave politics alone...

"So I started my career in atomic physics as Szilard's chauffeur, driving him out to the end of Long Island for my summer job at Columbia University, to ask Einstein to sign a famous letter to Roosevelt. The atomic age had started, and that's all the involvement Einstein ever had with the atomic bomb... (The letter said such a weapon would be scientifically feasible.)

"In the course of not a very long time, I found myself in Los Alamos, where very special work was to proceed. By the time we were through with it, there were 10,000 of us. I did not like the change in my work. I was used to work with a few close friends, practically one at a time. Now I was in a big group... We had a truly excellent Director. A great scientist. An excellent organizer, Robert Oppenheimer...

"Everything went, essentially, as predicted. There came the time of the test. The 16th of July at the Trinity Site in southern New Mexico. I was there just around sunrise. I was looking, contrary to regulations, straight at the bomb... I put on, in addition to the welding glass, dark glasses. I put gloves on my hands and pressed the glass against my eyes. I put on some suntan lotion and then I looked the beast in the eye... I lifted the glass and looked at the sand, and it was as though broad daylight were streaming into a completely dark room when you lifted a black curtain. Then, I was impressed...

"The bomb was dropped on Hiroshima. It should not have been. We should have first demonstrated. If we could have ended the war by showing the power of science without killing a single person, all of us would now be happier, more reasonable, and much more safe...



*"The bomb was dropped on Hiroshima. It should not have been.  
We should have first demonstrated."*

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*"If we can find the question, the answer —  
in the minds of millions of people — will take care of itself."*

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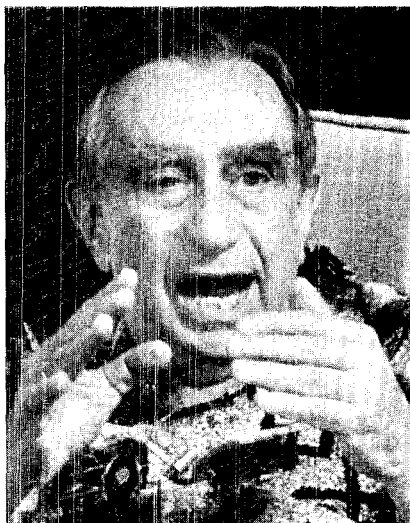
"I was already deeply interested in the hydrogen bomb, and we wrote out very carefully why nothing could possibly go wrong (while in Los Alamos)... Some believed that the power of the atomic bomb could keep the peace forever. By '49 the Russians had the atomic bomb and it was clear that they were reaching for more. I did not want to work on it, I wanted to help. I went to the best people... Fermi and (Hans) Bethe. They refused. And other great physicists came to me and told me there is no time to lose..."



The scientific challenge was great and seducing... We knew how to split the atom. We did not know how to put atoms together, how to perform fusion... That was not easy, because the administration of Los Alamos was against it. The scientific advisory committee of the Atomic Energy Commission was almost unanimously against it. Most of the scientific leaders considered it first wrong morally, and then not feasible. I felt I had no choice. I

knew the subject... It was done, but in the course of doing it, a deep and most regrettable cleavage appeared in the scientific community. In the end, it gave rise in many young people not only to an anti-military, but even to an anti-scientific attitude... What I claim, if indeed I have any merit, is that I stuck with it until I was sure it would be done..."

"I left Los Alamos and started to argue for a second laboratory (Lawrence Livermore) to make sure the work would progress. They provide competition, which is necessary, and it is friendly



competition..."

"In the first 30 years (of this century) there had been a blossoming of new ideas which I believe has not been paralleled by the Greeks, by Galileo, by Newton, or anybody... Then this flood of new ideas stopped... Now we are faced with the situation which requires ever more work, ever more money, for a little additional information..."

"Energy problems. That's the thing that is worrying me at the

present time, because we need energy from heaven and earth. Nuclear energy is not the whole answer, by far not, but it is a part of the answer; and those who try to tell us that it is too dangerous, don't know what they are talking about... we need nuclear energy, and solar energy, and oil, and coal, and geothermal energy... America has no longer a leadership role in technology, and is barely hanging on to its leadership in science..."

"I would like to conclude with a very old story and a good one. It is said that Gertrude Stein, when she was dying, was asking in a failing voice, what is the answer? There was none. Then she asked, then what is the question? Then she died. I can tell you what the question is: survival, not individual survival. I had a long and happy life, and it won't last much longer. It is the survival of human communities. Survival of ideas..."

"Some human communities may be threatened by atomic weapons, but not the whole of mankind; that is a fable. But whether America will survive the '80s and indeed will reach the year 2000 is a most serious question... America's bid for freedom, for freedom shared by everyone, will not survive without some reliance on arms. The question is whether we can think freely, because the Russians know the answers and that excludes free thought..."

"If we can find the question, and understand that freedom is at stake for the whole world, so that we have the freedom to use, rather than to misuse, the fruits of technology... If we find the question, the answer — in the minds of billions of people — will take care of itself."



# "SALT II must be defeated."

Edward Teller minced few words in opposing the SALT II treaty during an address in Los Alamos this fall.

"Something has become very clear... for the first time in history. The Russians are now ahead of us in the arms race."

Teller, who worked here on the Manhattan Project and who is now an associate director at Lawrence Livermore Laboratory, also offered, "I have been accused of 'crying wolf' too often. I did not say the wolf is at the door, only that he is coming. And he is."

Will the SALT II terms limit the arms race, and can they be verified? Teller said no, on both counts. Since the number of missiles would not be limited, only the number of missile launchers, the U.S.S.R. could fabricate thousands more without violating the letter of the agreement, said Teller. As for America, "We, of course, won't do it."

Further, "we would have a hard time finding out" whether the Russians were to build 3,000 more launchers rather than the limited 750, said Teller. Hardened missile silos, and the reuse of existing silos are to be prohibited. Yet what is detectable about missiles stored in warehouses or on ships, or some which might be in components and readily assembled? If these were deployed, said Teller, "It would be hard for us to do anything but attack. This, of course, I would not like to do."

The physicist, a Hungarian native who has become a respected

American scientist in the last 40 years, also answered another rhetorical question: "Why don't they take over the world now, which is their proclaimed aim?" Because the Russians are cautious, and they are not chess players, not poker players as after WW II. They want to win without warfare if possible.

The Russians, further, are masters of the "salami technique," said Teller. Just as this Hungarian staple is eaten a thin slice at a time, so the Russians work at international politics. "Peculiarly enough, in the end the salami is gone." This analogy applies to the Middle East, Teller feels, and if the U.S.S.R. gains control of two-thirds of the world's oil spigot, its influence in Europe and Japan, not to mention America, would be considerable.

In Iran, for instance, the U.S. backed down, said Teller, yet the Russians didn't move immediately in — that would have caused bloodshed and publicity. But since Iran is "woefully misgoverned," the chance remains for increased Russian influence in that country.

Turning to specific Russian steps that illustrate the salami technique, Teller pointed at the 3,000 Soviet combat troops stationed in Cuba. Our reaction to them is more important than their existence, he said, but they could be related the Backfire bomber issue as well. This new airplane, Russian-built, cannot complete a round trip to the U.S. without refueling, and Soviet leaders have said there are no plans to extend its range.

"I think that Brezhnev told the

truth. I also think he established a welcome committee in Cuba for the Backfire," said Teller. Yet SALT II, he continued, contains no word of this "formidable weapon."

Further, short-range SS-20 rockets are not limited in SALT II, and these could be potent weapons. With the addition of extra stages, these rockets could wipe out all Western European military bases overnight.

On the other hand, our Cruise missile, relatively cheap and safely deployable, can do a variety of defensive jobs, said Teller. Since it requires sophisticated microelectronics, a field in which we are 10 years ahead of Russia, "This is the natural way for us to go." But with SALT II, we would be restricted from discussing the matter with our allies, and the Cruise would be limited in deployment, he added.

"I don't want to see SALT II ratified... I want SALT II to come up for a vote and be decisively defeated. That will bring home to the American people that there is trouble," Teller said.

He also stated that the U.S. is "now in a quantitative arms race which we have lost and which will be very hard to win." Our strategies for defense and deterrence must be discussed with all our allies, so that a year from now we can determine not whether we are winning or losing, "but whether we have a chance to survive," Teller continued.

He also outlined some of his ideas, which he said would help to "mobilize technology" to protect





Illustration by Gail Flower

the peaceful existence of free communities.

First, said Teller, a remotely piloted vehicle can be used for surveillance and communications, and it has no crew. The Cruise is a "primitive example."

Second, the SALT treaty permits research for antiballistic missiles, yet we do little such work, said Teller. Laser and particle beam defenses should be further explored as well, he added.

Third, the neutron bomb is a small device that could be mass produced. While leaving civilians unharmed a mile away, it would kill enemy tank crews at once. Teller said the neutron bomb

should be part of our retaliatory arsenal following an attack against us or an ally, but we should also declare that we would never use it in a first strike, nor would we drop it over any enemy territory unless nuclear weapons had already been used by an aggressor. The neutron bomb poses less civilian danger than a conventional artillery barrage, he said.

Fourth, we must strengthen our civil defense preparations. The U.S.S.R. plans to evacuate major population centers within 48 hours, and that should be our goal as well. Industrial rebuilding could take place in 3 years, he said.

Contrary to public opinion,

nuclear weapons are not all that effective without guidance systems, or against moving objects, said Teller. America certainly can't completely disable the Soviets after they launch a first strike. "Such a thing as overkill does not exist."

The scientist also said he had a hard time believing he would work on nuclear warfare back in 1940. But Teller changed his mind the day after Adolf Hitler invaded the Low Countries. President Franklin Roosevelt then said that if scientists in the free world would not work on weapons, freedom would be lost. "I knew then he'd acted on Einstein's letter," said Teller. "Since, I've not changed my mind."

— JLP

# Years ago

## 20 years ago

### **Hello from Aga Khan**

The boy god of 20 million people dropped in on Los Alamos to spend Thanksgiving morning. His Highness The Aga Khan IV, the 23-year-old spiritual leader of Ismaili Moslems in 21 countries, flew in for a surprise visit to discuss work of the Health Research Laboratory. The young prince is on a \$2.5 million fundraising tour to help finance a medical research wing at a hospital he established last year in Nairobi, Kenya.

### **Measuring space dose**

The radiation dose the first astronaut may encounter in his future explorations of outer space should be determined this winter by LASL scientists. Marvin Van Dilla and Ernest Anderson, working with a team from Kirtland Air Force Base, hope to obtain information from a tissue equivalent dosimeter aboard a satellite, scheduled to be fired into orbit soon. The orbit will be about 200 miles high. The little device from LASL, weighing 1.5 pounds, has a 3-inch ionization chamber.

### **The grandest Stretch**

Stretch, grandest computer of them all, is scheduled to be delivered here next June. The machine is being built by IBM in Poughkeepsie, N.Y., on specifications drawn up in Los Alamos. It's called Stretch because designers say we are coming down the stretch in computer design — there is not much farther we can go with techniques known today.

## 15 years ago

### **The south 40**

Samples of farmland, in 20-ton lots, have been moved to New Mexico from South Dakota and Kansas for a unique experiment involving radiation in soils and plants. The samples will be used in a series of Health Division tests that may take up to 10 years to complete, but which will give a good idea of what happens to radioactive waste materials that might be introduced to crop-producing lands.

### **Lauding Rover**

The tests conducted at the Nuclear Rocket Development Station in Nevada constitute the greatest advances in rocketry since Goddard started flying his systems in New Mexico in the 1920s and 30s. So said Harold B. Finger, head of the country's Space Nuclear Propulsion Office, during a press briefing in the capital city. He said it was conceivable that 2 to 20 million pounds could be shaved from the total payload by using nuclear rockets.

### **Another ghost town**

In southern Nevada is a dreary little place called Camp Desert Rock. It was a busy Army post 10 years ago, but today it is just another ghost town. Tables and chairs are still neatly stacked in the PX and ventilation stacks turn in the wind. The Army chose it for troop indoctrination on weapons effects. The first soldiers moved into camp October 1, 1951.

## 10 years ago

### **Bradbury to resign**

Norris Bradbury, Director since 1945, has announced his intention to resign "not later than October, 1970." Today, he oversees a laboratory with more than 4,200 employees; a capital investment of more than \$260 million; and an annual operating budget of over \$100 million.

### **Liaison for weapons**

About 2 years ago, a new group was added to the Weapons Division and was tucked away at the bottom of Los Alamos Canyon. It has since become well known among the top echelon of the national nuclear weapons establishment. The group is W-9, charged with exchanging information on weapons matters within the Laboratory and the Atomic Energy Commission and the Department of Defense.

**Taken from the files  
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